ABSTRACT OF THE DISCLOSURE

A therapeutic radiation source includes an in situ radiation detecting system for monitoring in real time an amount of the therapeutic radiation that has been generated. An electron source generates electrons in response to light that is transmitted through a fiber optic cable and impinges upon the electron source. The electrons are accelerated toward the target and strike the target, causing the target to emit therapeutic radiation, such as x-rays. A scintillator is disposed along a path of a portion of the emitted therapeutic radiation, and generates scintillator light corresponding to the intensity of the therapeutic radiation that is incident upon the scintillator. A photodetector in optical communication with the scintillator produces a signal indicative of the intensity of the therapeutic radiation incident upon the scintillator.